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10/788,891	02/27/2004	Paul S. Palumbo	99097CIPCON	4560

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Law Department
157 Concord Road
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EXAMINER	
NILAND, PATRICK DENNIS	
ART UNIT	PAPER NUMBER
1796	
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12/10/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/788,891	PALUMBO ET AL.	
	Examiner	Art Unit	
	Patrick D. Niland	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-25,34,35 and 40-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-25, 34-35, and 40-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The amendment of 8/19/09 has been entered. Claims 21-25, 34-35, and 40-55 are pending.

2. The references lined through on the IDS of 2/5/08 were not supplied with the IDS and were not readily available to the examiner and were lined through in accordance with 37 CFR 1.97 and 1.98.

The references lined through on the IDS of 11/20/08 were not supplied with the IDS and were not readily available to the examiner and were lined through in accordance with 37 CFR 1.97 and 1.98.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 53-55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. The instant claims 53-55 use a mixture of open and closed language, e.g. "comprising" and "consisting". It is unclear what is intended by this mixture of open and closed language. Specifically, it is unclear what is intended to be excluded, if anything, and what is intended to be included, other than that which is claimed, by this mixture of open and closed language.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

> international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 21-22, 24, 34-35, 40-45, and 48-55 are rejected under 35 U.S.C. 102(e) as being anticipated by Moffatt et al. '257 (U.S. 6,323,257).

Moffatt et al. '257 disclose modified pigment and ink jet ink comprising modified pigment wherein the modified pigment has attached at least one directly attached organic group which is the reaction product of (2-sulfatoethyl)-sulfone group and at least one nucleophilic polymer such as those obtained from ester of acrylic acid, i.e. polyacrylate, and containing polyalkylene glycol (col. 4, lines 12-23 and 42-62 noting the formula in which X=SO sub 2, col. 6, lines 6-12 and 30, co1. 12, line 20, col. 13, lines 15-25, col. 16, lines 25-30, and table bridging cols. 5-6/7-8 which discloses numerous amino and amide containing monomers which falls within the scope of the moieties comprised by the instantly claimed chemical groups 1, 2, and 3). In light of the above, it is clear that Moffatt et al. '257 anticipates the present claims. The reaction of the (2-sulfatoethyl)-sulfone group and the nucleophilic polymer of the patentee gives a third chemical group, e.g. the moiety resulting from the reaction which comprises the instantly claimed groups, e.g. amine and/or amide groups.

Applicants argue that Moffatt et al. '257 is not a relevant reference against the present claims given that Moffatt et al. '257 clearly teaches modified pigment which is reaction product

of polymerization reaction with attached reactive group, i.e. 2-(sulfatoethyl)-sulfone, which is in direct contrast to the present claims that require modified pigment comprising pigment having attached at least one organic group which is the reaction product of at least one (2-sulfatoethyl) sulfone group and at least one nucleophilic polymer.

It is agreed that the modified pigment of Moffatt et al. '257 is prepared by reacting polymer having first chemical group, i.e. (2-sulfatoethyl) sulfone, with monomer which is then polymerized resulting in covalently attached polymer. However, it is noted that the end result of Moffatt et al. '257 is the same as presently claimed, i.e. the attachment of nucleophilic polymer to the reactive group that is attached to the pigment. This can be seen in Figure 1 of Moffatt et al. '257 that shows that the polymeric group is attached to the pigment. The applicant has not rebutted or otherwise addressed this portion of the cited prior art. This portion of the cited prior art clearly rebuts the applicant's arguments, particularly those of page 9 and the paragraph bridging pages 9 and 10 of the applicant's response of 8/19/09. No mention of the clear teaching of the patentee's Fig. 1 is seen in the applicant's response.

It is noted that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process", *In re Thorpe,* 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Further, "although produced by a different process,

the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product", *In re Marosi,* 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir.1983). See MPEP 2113. This issue is not addressed in the applicant's remarks. There is no probative evidence that the instantly claimed reactions do not occur in the cited prior art, as claimed. It is noted that the instant claims do not recite the particular reaction conditions of the instantly claimed reactive groups attached to the pigment and the polymer containing the reactive groups of the above cited claims. Therefore, the claims are taken as encompassing the polymerization of the instantly claimed polymer in situ with the pigment as long as the specified reaction takes place. Fig. 1 of the patentee is clear evidence that the instantly claimed reactions do take place in the method and products of Moffatt. The reasons for expecting the instantly claimed reactions to have taken place stated in this rejection are also reasonable on their face, as would be understood by the ordinary skilled artisan. The applicant has provided no probative evidence to rebut these conclusions, particularly in view of Fig. 1 of the patentee.

Therefore, absent evidence of criticality regarding the presently claimed process and given that Moffatt et al. '257 disclose product as presently claimed, i.e. pigment having nucleophilic polymer attached to (2-sulfatoethyl)-sulfone group that is attached to pigment, it is the examiner's position that Moffatt et al. '257 meets the requirements of the present claims.

Applicants also argue that the polymer pointed to by the examiner, i.e. obtained from ester of acrylic acid and containing polyalkylene glycol, is not a nucleophilic polymer.

However, it is noted that col.6, line 30 of Moffatt et al. '257 pointed to by the examiner in paragraph 7 of the office action mailed 5/9/06 discloses the use of monomers including alkylene glycols and their ethers derived from acrylic and methacrylic acid which clearly encompasses polymer obtained from alkylene glycol. As set forth on page 9, line 27 of the present specification, polyalkylene glycol is a nucleophilic polymer within the scope of the present claims. Further, the examiner also pointed to Table bridging cols. 5-6/7-8 which includes monomers utilized to obtain nucleophilic polymer. Specific examples of such monomers are found in cols. 11-12 and include monomers such as dimethylaminoethyl acrylate and numerous acrylamides are disclosed. Thus, the reaction of the first chemical group of the patentee with the second chemical group of the patentee makes a third chemical group and all of these chemical groups comprise chemical groups falling within the scope of those of the instant claim 40.

It is also noted that the "vinyl acetate and alcohols" of column 6, line 32 means vinyl alcohol as vinyl alcohol is well known to be produced by hydrolysis of vinyl acetate polymer and is encompassed by the instant claim 24. The moiety of column 5, lines 15-20 is the intermediate apparently intended to be formed by the applicant from the instantly claimed compound of claim 23 as seen at page 12 of the instant specification. This compound in conjunction with the above cited monomers of the patentee will necessarily form the same linkage as obtained by the applicant. No probative evidence to the contrary is seen.

The applicant argues that Moffatt does not disclose the modified pigment of the instant claim 21. As discussed above, Moffatt clearly describes "A modified pigment comprising a pigment having attached at least one organic group, wherein said organic group comprises: the reaction product of at least one (2-sulfatoethyl)-sulfone group and at least one nucleophilic polymer. The

applicant's use of "reaction product of a polymerization reaction", which gives the instantly claimed polymer nucleophile, "with the attached reactive groups", e.g. the (2-sulfatoethyl)-sulfone group that is attached to pigment clearly gives the claimed pigment of claim 21. The applicant's arguments provide no evidence to the contrary. Furthermore, the monomers which are to be polymerized of the patentee fall within the scope of the second chemical group and the additional second chemical group (instant claims 14-15). Furthermore, it is not seen that polymers forming in the reaction of the patentee do not subsequently bond to other pigment particle reactive sites by the instantly claimed reactions requiring the second chemical group to be a polymer (instant claims 8-11). This would be expected to occur necessarily and inherently since the same reactive moieties as those of the instant claims are present during the chemical reaction/polymerization of the patentee. No probative evidence to the contrary is seen. See MPEP 2112-2113. It is not seen that "at least one nucleophile of at least one nucleophilic polymer" overcomes the above rejection. Applicant's belief that the pigment of Moffatt is not that of the instant claims is noted. However, there is no probative evidence that the modified pigment of Moffatt is not that of the instant claims, within the scope of the instant claim language, particularly where the above cited compounds are used which are expected to give the instantly claimed pigment. The teaching that the attached reactive groups allow the polymerization to occur in water does not show that nucleophilic groups of the polymers that result from the polymerization, noting the polymers of Moffatt, do not react with electrophilic groups of the reactive groups or vice versa. Moffatt, column 6, lines 15-18, argued by the applicant, is not seen as teaching away from the radical polymerization being one in which nucleophiles of the monomers react with electrophiles of the reactive groups on the pigment with

the remaining unsaturated group reacting via the free radical mechanism disclosed. This however, does not exclude such nucleophiles on the polymers disclosed by Moffatt from subsequently reacting after the polymerization. In any event, it is not seen that the product of the patentee does not fall within the scope of that of the instant claims. The same argument applies to the instant method claims. The argument that the nucleophile/2-sulfatoethyl-sulphone reaction is not disclosed does not show that it is not inherent. If this reaction occurs in the instant application, it is also expected to necessarily occur in Moffatt's reaction system. See MPEP 2112. The examiner also does not agree that column 6, lines 15-18 of Moffatt necessarily means that the reaction of monomer with reactive groups of the pigment is a free radical reaction. It is seen that the polymerization is a free radical reaction. It remains unclear how or that the reaction with the compound of column 4, lines 52-63 in which X is an SO sub 2 would give a free radical reaction with the monomers of Moffatt. Reaction with the nucleophiles of the monomers of Moffatt appears much more likely, particularly considering the monomers having nucleophile gorups of Moffatt.

The cited prior art is applied to the newly presented claims 53-55 for the reasons stated above. Considering the mixture of open and closed language in the instant claims 53-55, it is not seen that any additional things which might be required by Moffatt, either in their products or processes, are excluded from the instant claims 53-55. MPEP 2113 and the rationale related thereto stated above also apply to the instant claims 54-55.

Applicant's arguments to monomers without nucleophilic groups ignores Moffatt's teachings of monomers with nucleophilic groups, which is the basis of this rejection. These arguments are therefore not commensurate with the full teachings of Moffatt and do not address the above

stated rejection. Why nucleophilic containing polymers would attach to the pigments of Moffatt is clearly stated above, contrary to the applicant's arguments. The reason is that Moffatt teaches the use of the instantly claimed groups, including electrophiles and nucleophiles of the instant claims. They are expected to react in Moffatt just as they do in the instant claims. No probative evidence to the contrary is seen. See MPEP 2112. Attorney argument does not take the place of probative evidence where required (MPEP 2145). The examiner maintains that the above rationale is sufficient to require probative evidence to rebut it. The attorney argument that when monomer with nucleophile is chosen from Moffatt's monomers, the resulting reaction product would be very different from that of the present invention is not supported by probative evidence nor clearly seen on its face, particularly considering the full teachings of Moffatt and the breadth of the encompassed reactions of the instant claims. It is further not seen that this is "well known" as argued. The examiner has examined arts involving pigment dispersions for about 20 years and has never seen such a teaching nor has the examiner heard this in school. It is therefore not seen as being well known. The product of the modified pigment and attached growing chain argued by the applicant is not subject of the above rejection. The above rejection relates to the pigment/fully grown polymer chain, which is encompassed by the instant claims. Addition reactions do not go on forever. There is no recitation of "preformed" in the instant claims. This argument is not commensurate in scope with the claims therefore. Additionally, it is not seen that even if "preformed" were recited, that the instant product claims would not still be anticipated by Moffatt's disclosure. See MPEP 2112-2113. The instant claims recite no molecular weight nor polydispersity nor provide probative evidence that polymers grown from the surface of pigment are any different than the polymers encompassed by the instant claims.

Applicant's arguments in these regards are therefore not persuasive. The first sentence of the last paragraph of page 11 of the applicant's response of 8/19/09 is not understood. It is not seen how the growing polymers of Moffatt would react with the nucleophilic groups of the above discussion nor is there probative evidence that such reaction would be expected to occur. In any event, it is not seen that even were the apparently argued reaction between nucleophilic groups of the polymer of Moffatt and the growing polymer were to occur, that no nucleophilic groups would remain that react with the pigment, as discussed above. No polymerization proceeds to 100% completion. Therefore, unreacted nucleophilic groups would remain on the polymer of Moffatt which would react with electrophiles on the pigment of Moffatt per the expectation explained above. No probative evidence to the contrary is seen.

The applicant's arguments have been fully considered but are not persuasive for the reasons stated above and the teachings of the cited prior art. For the above reasons, this rejection is maintained.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1,148 USPQ 459 (1966),

that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art. 2. Ascertaining the differences between the prior art and the claims at issue. 3. Resolving the level of ordinary skill in the pertinent art. 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 21-22, 24-25, 34-35, and 40-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moffatt et al. '257 (U.S. 6,323,257) in view of Moffatt et al. (U.S. 6,221,932).

The disclosure with respect to Moffatt et al. in paragraph 7 above is incorporated here by reference.

The difference between Moffatt et al. '257 and the present claimed invention is the requirement in the claims of specific type of polymer. Moffatt et al. '932, which is drawn to ink composition comprising modified pigment, disclose attaching polymer such as polyethyleneimine to pigment in order to produce an ink with increased smearfastness, enhanced

print quality, and improved bleed control. Moffatt et al. '932 further disclose the equivalence and interchangeability of polyalkylene glycols, as disclosed by Moffatt et al. '257, with polyethyleneimine (col. 1, lines 15-23, col.5, lines 43-44, 53, and 63-65, and col.6, lines 45-55). In light of the motivation for using specific type of polymer disclosed by Moffatt et al. '932 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polymer in the pigment of Moffatt et al. '257 in order to produce an ink with increased smearfastness, enhanced print quality, and improved bleed control, and thereby arrive at the claimed invention. Again, where the moieties disclosed by Moffatt are those of the instant claims, they are expected to necessarily and inherently produce compounds falling within the scope of the instant claims. There is no probative evidence that the argued reactions do not necessarily occur during the processing and reacting of the reference.

This rejection is maintained for the reasons stated in paragraph 7 above.

10. Claims 21-24, 34-35, 40-46, and 48-55 are rejected under 35 USC 103(a) as being unpatentable over Moffatt et al. '257 (U.S. 6,323,257) in view of US Pat. No. 3900510 Fuchs et al..

Moffatt et al. '257 disclose modified pigment and ink jet ink comprising modified pigment wherein the modified pigment has attached at least one directly attached organic group which is the reaction product of (2-sulfatoethyl)-sulfone group and at least one nucleophilic polymer such as those obtained from ester of acrylic acid, i.e. polyacrylate, and containing polyalkylene glycol (col. 4, lines 12-23 and 42-62 noting the formula in which X=SO sub 2, col. 6, lines 6-12 and 30, co1. 12, line 20, col. 13, lines 15-25, col. 16, lines 25-30, and table bridging cols. 5-6/7-8 which discloses numerous amino and amide containing monomers which falls within the scope of the

moieties comprised by the instantly claimed chemical groups 1, 2, and 3). In light of the above, it is clear that Moffatt et al. '257 anticipates the present claims. The reaction of the (2-sulfatoethyl)-sulfone group and the nucleophilic polymer of the patentee gives a third chemical group, e.g. the moiety resulting from the reaction which comprises the instantly claimed groups, e.g. amine and/or amide groups.

Applicants argue that Moffatt et al. '257 is not a relevant reference against the present claims given that Moffatt et al. '257 clearly teaches modified pigment which is reaction product of polymerization reaction with attached reactive group, i.e. 2-(sulfatoethyl)-sulfone, which is in direct contrast to the present claims that require modified pigment comprising pigment having attached at least one organic group which is the reaction product of at least one (2-sulfatoethyl) sulfone group and at least one nucleophilic polymer.

It is agreed that the modified pigment of Moffatt et al. '257 is prepared by reacting polymer having first chemical group, i.e. (2-sulfatoethyl) sulfone, with monomer which is then polymerized resulting in covalently attached polymer. However, it is noted that the end result of Moffatt et al. '257 is the same as presently claimed, i.e. the attachment of nucleophilic polymer to the reactive group that is attached to the pigment. This can be seen in Figure 1 of Moffatt et al. '257 that shows that the polymeric group is attached to the pigment. The applicant has not rebutted or otherwise addressed this portion of the cited prior art. This portion of the cited prior art clearly rebuts the applicant's arguments, particularly those of page 9 and the paragraph bridging pages 9 and 10 of the applicant's response of 8/19/09. No mention of the clear teaching of the patentee's Fig. 1 is seen in the applicant's response.

It is noted that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process", *In re Thorpe,* 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Further, "although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product", *In re Marosi,* 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir.1983). See MPEP 2113. This issue is not addressed in the applicant's remarks. There is no probative evidence that the instantly claimed reactions do not occur in the cited prior art, as claimed. It is noted that the instant claims do not recite the particular reaction conditions of the instantly claimed reactive groups attached to the pigment and the polymer containing the reactive groups of the above cited claims. Therefore, the claims are taken as encompassing the polymerization of the instantly claimed polymer in situ with the pigment as long as the specified reaction takes place. Fig. 1 of the patentee is clear evidence that the instantly claimed reactions do take place in the method and products of Moffatt. The reasons for expecting the instantly claimed reactions to have taken place stated in this rejection are also reasonable on their face, as would be understood by the ordinary skilled artisan. The applicant has provided no probative evidence to rebut these conclusions, particularly in view of Fig. 1 of the patentee.

Therefore, absent evidence of criticality regarding the presently claimed process and given that Moffatt et al. '257 disclose product as presently claimed, i.e. pigment having

nucleophilic polymer attached to (2-sulfatoethyl)-sulfone group that is attached to pigment, it is the examiner's position that Moffatt et al. '257 meets the requirements of the present claims.

Applicants also argue that the polymer pointed to by the examiner, i.e. obtained from ester of acrylic acid and containing polyalkylene glycol, is not a nucleophilic polymer.

However, it is noted that col.6, line 30 of Moffatt et al. '257 pointed to by the examiner in paragraph 7 of the office action mailed 5/9/06 discloses the use of monomers including alkylene glycols and their ethers derived from acrylic and methacrylic acid which clearly encompasses polymer obtained from alkylene glycol. As set forth on page 9, line 27 of the present specification, polyalkylene glycol is a nucleophilic polymer within the scope of the present claims. Further, the examiner also pointed to Table bridging cols. 5-6/7-8 which includes monomers utilized to obtain nucleophilic polymer. Specific examples of such monomers are found in cols. 11-12 and include monomers such as dimethylaminoethyl acrylate and numerous acrylamides are disclosed. Thus, the reaction of the first chemical group of the patentee with the second chemical group of the patentee makes a third chemical group and all of these chemical groups comprise chemical groups falling within the scope of those of the instant claim 40.

It is also noted that the "vinyl acetate and alcohols" of column 6, line 32 means vinyl alcohol as vinyl alcohol is well known to be produced by hydrolysis of vinyl acetate polymer and is encompassed by the instant claim 24. The moiety of column 5, lines 15-20 is the intermediate apparently intended to be formed by the applicant from the instantly claimed compound of claim 23 as seen at page 12 of the instant specification. This compound in conjunction with the above

cited monomers of the patentee will necessarily form the same linkage as obtained by the applicant. No probative evidence to the contrary is seen.

The applicant argues that Moffatt does not disclose the modified pigment of the instant claim 21. As discussed above, Moffatt clearly describes "A modified pigment comprising a pigment having attached at least one organic group, wherein said organic group comprises: the reaction product of at least one (2-sulfatoethyl)-sulfone group and at least one nucleophilic polymer. The applicant's use of "reaction product of a polymerization reaction", which gives the instantly claimed polymer nucleophile, "with the attached reactive groups", e.g. the (2-sulfatoethyl)-sulfone group that is attached to pigment clearly gives the claimed pigment of claim 21. The applicant's arguments provide no evidence to the contrary. Furthermore, the monomers which are to be polymerized of the patentee fall within the scope of the second chemical group and the additional second chemical group (instant claims 14-15). Furthermore, it is not seen that polymers forming in the reaction of the patentee do not subsequently bond to other pigment particle reactive sites by the instantly claimed reactions requiring the second chemical group to be a polymer (instant claims 8-11). This would be expected to occur necessarily and inherently since the same reactive moieties as those of the instant claims are present during the chemical reaction/polymerization of the patentee. No probative evidence to the contrary is seen. See MPEP 2112-2113. It is not seen that "at least one nucleophile of at least one nucleophilic polymer" overcomes the above rejection. Applicant's belief that the pigment of Moffatt is not that of the instant claims is noted. However, there is no probative evidence that the modified pigment of Moffatt is not that of the instant claims, within the scope of the instant claim language, particularly where the above cited compounds are used which are expected to give the

instantly claimed pigment. The teaching that the attached reactive groups allow the polymerization to occur in water does not show that nucleophilic groups of the polymers that result from the polymerization, noting the polymers of Moffatt, do not react with electrophilic groups of the reactive groups or vice versa. Moffatt, column 6, lines 15-18, argued by the applicant, is not seen as teaching away from the radical polymerization being one in which nucleophiles of the monomers react with electrophiles of the reactive groups on the pigment with the remaining unsaturated group reacting via the free radical mechanism disclosed. This however, does not exclude such nucleophiles on the polymers disclosed by Moffatt from subsequently reacting after the polymerization. In any event, it is not seen that the product of the patentee does not fall within the scope of that of the instant claims. The same argument applies to the instant method claims. The argument that the nucleophile/2-sulfatoethyl-sulphone reaction is not disclosed does not show that it is not inherent. If this reaction occurs in the instant application, it is also expected to necessarily occur in Moffatt's reaction system. See MPEP 2112. The examiner also does not agree that column 6, lines 15-18 of Moffatt necessarily means that the reaction of monomer with reactive groups of the pigment is a free radical reaction. It is seen that the polymerization is a free radical reaction. It remains unclear how or that the reaction with the compound of column 4, lines 52-63 in which X is an SO sub 2 would give a free radical reaction with the monomers of Moffatt. Reaction with the nucleophiles of the monomers of Moffatt appears much more likely, particularly considering the monomers having nucleophile gorups of Moffatt.

The cited prior art is applied to the newly presented claims 53-55 for the reasons stated above. Considering the mixture of open and closed language in the instant claims 53-55, it is not seen

that any additional things which might be required by Moffatt, either in their products or processes, are excluded from the instant claims 53-55. MPEP 2113 and the rationale related thereto stated above also apply to the instant claims 54-55.

Applicant's arguments to monomers without nucleophilic groups ignores Moffatt's teachings of monomers with nucleophilic groups, which is the basis of this rejection. These arguments are therefore not commensurate with the full teachings of Moffatt and do not address the above stated rejection. Why nucleophilic containing polymers would attach to the pigments of Moffatt is clearly stated above, contrary to the applicant's arguments. The reason is that Moffatt teaches the use of the instantly claimed groups, including electrophiles and nucleophiles of the instant claims. They are expected to react in Moffatt just as they do in the instant claims. No probative evidence to the contrary is seen. See MPEP 2112. Attorney argument does not take the place of probative evidence where required (MPEP 2145). The examiner maintains that the above rationale is sufficient to require probative evidence to rebut it. The attorney argument that when monomer with nucleophile is chosen from Moffatt's monomers, the resulting reaction product would be very different from that of the present invention is not supported by probative evidence nor clearly seen on its face, particularly considering the full teachings of Moffatt and the breadth of the encompassed reactions of the instant claims. It is further not seen that this is "well known" as argued. The examiner has examined arts involving pigment dispersions for about 20 years and has never seen such a teaching nor has the examiner heard this in school. It is therefore not seen as being well known. The product of the modified pigment and attached growing chain argued by the applicant is not subject of the above rejection. The above rejection relates to the pigment/fully grown polymer chain, which is encompassed by the instant claims.

Addition reactions do not go on forever. There is no recitation of "preformed" in the instant claims. This argument is not commensurate in scope with the claims therefore. Additionally, it is not seen that even if "preformed" were recited, that the instant product claims would not still be anticipated by Moffatt's disclosure. See MPEP 2112-2113. The instant claims recite no molecular weight nor polydispersity nor provide probative evidence that polymers grown from the surface of pigment are any different than the polymers encompassed by the instant claims. Applicant's arguments in these regards are therefore not persuasive. The first sentence of the last paragraph of page 11 of the applicant's response of 8/19/09 is not understood. It is not seen how the growing polymers of Moffatt would react with the nucleophilic groups of the above discussion nor is there probative evidence that such reaction would be expected to occur. In any event, it is not seen that even were the apparently argued reaction between nucleophilic groups of the polymer of Moffatt and the growing polymer were to occur, that no nucleophilic groups would remain that react with the pigment, as discussed above. No polymerization proceeds to 100% completion. Therefore, unreacted nucleophilic groups would remain on the polymer of Moffatt which would react with electrophiles on the pigment of Moffatt per the expectation explained above. No probative evidence to the contrary is seen.

The difference between Moffatt et al. '257and the presently claimed invention is the requirement in the claims that the first chemical group is attached to the pigment using diazonium salt of the specific type of (2-sulfatoethyl) Sulfone group. Moffatt et al. '257 does not teach the use of the instantly claimed sulfatoethylsulfone group to attach to the pigment but does disclose using diazonium moieties to do so at column 3, lines 43-49 to attach the first chemical group is attached to the pigment. Fuchs shows that reacting alkaline agent and the sulfuric acid

ester of aminobenzylsulfone ethylenesulfonate will give the vinyl aminobenzylsulfone.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art at the time of the instantly claimed invention to use diazonium salt to attach the first chemical group to the pigment of Moffatt et al. '257 using the compound of the instant claims 5-7 and 23 and to treat this compound with the alkaline compound to arrive at the compound of column 5, lines 15-20 of Moffatt '257; and thereby arrive at the claimed invention. Again, where the moieties disclosed by Moffatt are those of the instant claims, they are expected to necessarily and inherently produce compounds falling within the scope of the instant claims. There is no probative evidence that the argued reactions do not necessarily occur during the processing and reacting of the reference. See MPEP 2112-2113. The complexity and presence of side reactions in such complex mixtures is taught in basic undergraduate organic chemistry and is certainly expected by the ordinary skilled artisan.

The applicant's arguments have been fully considered but are not persuasive for the reasons stated above. There is no showing of unexpected results commensurate in scope with the cited prior art and the instant claims.

11. Claims 25 and 46-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moffatt et al. '257 in view of Moffatt et al. (U S 6,221932) as applied to the claims in paragraph 9 above, and further in view of WO 99/31157.

Moffatt et al. '257 disclose modified pigment and ink jet ink comprising modified pigment wherein the modified pigment has attached at least one directly attached organic group which is the reaction product of (2-sulfatoethyl)-sulfone group and at least one nucleophilic polymer such as those obtained from ester of acrylic acid, i.e. polyacrylate, and containing polyalkylene glycol

(col. 4, lines 12-23 and 42-62 noting the formula in which X=SO sub 2, col. 6, lines 6-12 and 30, co1. 12, line 20, col. 13, lines 15-25, col. 16, lines 25-30, and table bridging cols. 5-6/7-8 which discloses numerous amino and amide containing monomers which falls within the scope of the moieties comprised by the instantly claimed chemical groups 1, 2, and 3). In light of the above, it is clear that Moffatt et al. '257 anticipates the present claims. The reaction of the (2-sulfatoethyl)-sulfone group and the nucleophilic polymer of the patentee gives a third chemical group, e.g. the moiety resulting from the reaction which comprises the instantly claimed groups, e.g. amine and/or amide groups.

Applicants argue that Moffatt et al. '257 is not a relevant reference against the present claims given that Moffatt et al. '257 clearly teaches modified pigment which is reaction product of polymerization reaction with attached reactive group, i.e. 2-(sulfatoethyl)-sulfone, which is in direct contrast to the present claims that require modified pigment comprising pigment having attached at least one organic group which is the reaction product of at least one (2-sulfatoethyl) sulfone group and at least one nucleophilic polymer.

It is agreed that the modified pigment of Moffatt et al. '257 is prepared by reacting polymer having first chemical group, i.e. (2-sulfatoethyl) sulfone, with monomer which is then polymerized resulting in covalently attached polymer. However, it is noted that the end result of Moffatt et al. '257 is the same as presently claimed, i.e. the attachment of nucleophilic polymer to the reactive group that is attached to the pigment. This can be seen in Figure 1 of Moffatt et al. '257 that shows that the polymeric group is attached to the pigment. The applicant has not rebutted or otherwise addressed this portion of the cited prior art. This portion of the cited prior art clearly rebuts the applicant's arguments, particularly those of page 9 and the paragraph

bridging pages 9 and 10 of the applicant's response of 8/19/09. No mention of the clear teaching of the patentee's Fig. 1 is seen in the applicant's response.

It is noted that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process", *In re Thorpe,* 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Further, "although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product", *In re Marosi,* 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir.1983). See MPEP 2113. This issue is not addressed in the applicant's remarks. There is no probative evidence that the instantly claimed reactions do not occur in the cited prior art, as claimed. It is noted that the instant claims do not recite the particular reaction conditions of the instantly claimed reactive groups attached to the pigment and the polymer containing the reactive groups of the above cited claims. Therefore, the claims are taken as encompassing the polymerization of the instantly claimed polymer in situ with the pigment as long as the specified reaction takes place. Fig. 1 of the patentee is clear evidence that the instantly claimed reactions do take place in the method and products of Moffatt. The reasons for expecting the instantly claimed reactions to have taken place stated in this rejection are also reasonable on their face, as would be understood by the ordinary skilled artisan. The applicant has provided no probative evidence to rebut these conclusions, particularly in view of Fig. 1 of the patentee.

Therefore, absent evidence of criticality regarding the presently claimed process and given that Moffatt et al. '257 disclose product as presently claimed, i.e. pigment having nucleophilic polymer attached to (2-sulfatoethyl)-sulfone group that is attached to pigment, it is the examiner's position that Moffatt et al. '257 meets the requirements of the present claims.

Applicants also argue that the polymer pointed to by the examiner, i.e. obtained from ester of acrylic acid and containing polyalkylene glycol, is not a nucleophilic polymer.

However, it is noted that col.6, line 30 of Moffatt et al. '257 pointed to by the examiner in paragraph 7 of the office action mailed 5/9/06 discloses the use of monomers including alkylene glycols and their ethers derived from acrylic and methacrylic acid which clearly encompasses polymer obtained from alkylene glycol. As set forth on page 9, line 27 of the present specification, polyalkylene glycol is a nucleophilic polymer within the scope of the present claims. Further, the examiner also pointed to Table bridging cols. 5-6/7-8 which includes monomers utilized to obtain nucleophilic polymer. Specific examples of such monomers are found in cols. 11-12 and include monomers such as dimethylaminoethyl acrylate and numerous acrylamides are disclosed. Thus, the reaction of the first chemical group of the patentee with the second chemical group of the patentee makes a third chemical group and all of these chemical groups comprise chemical groups falling within the scope of those of the instant claim 40.

It is also noted that the "vinyl acetate and alcohols" of column 6, line 32 means vinyl alcohol as vinyl alcohol is well known to be produced by hydrolysis of vinyl acetate polymer and is encompassed by the instant claim 24. The moiety of column 5, lines 15-20 is the intermediate apparently intended to be formed by the applicant from the instantly claimed compound of claim

23 as seen at page 12 of the instant specification. This compound in conjunction with the above cited monomers of the patentee will necessarily form the same linkage as obtained by the applicant. No probative evidence to the contrary is seen.

The applicant argues that Moffatt does not disclose the modified pigment of the instant claim 21. As discussed above, Moffatt clearly describes "A modified pigment comprising a pigment having attached at least one organic group, wherein said organic group comprises: the reaction product of at least one (2-sulfatoethyl)-sulfone group and at least one nucleophilic polymer. The applicant's use of "reaction product of a polymerization reaction", which gives the instantly claimed polymer nucleophile, "with the attached reactive groups", e.g. the (2-sulfatoethyl)-sulfone group that is attached to pigment clearly gives the claimed pigment of claim 21. The applicant's arguments provide no evidence to the contrary. Furthermore, the monomers which are to be polymerized of the patentee fall within the scope of the second chemical group and the additional second chemical group (instant claims 14-15). Furthermore, it is not seen that polymers forming in the reaction of the patentee do not subsequently bond to other pigment particle reactive sites by the instantly claimed reactions requiring the second chemical group to be a polymer (instant claims 8-11). This would be expected to occur necessarily and inherently since the same reactive moieties as those of the instant claims are present during the chemical reaction/polymerization of the patentee. No probative evidence to the contrary is seen. See MPEP 2112-2113. It is not seen that "at least one nucleophile of at least one nucleophilic polymer" overcomes the above rejection. Applicant's belief that the pigment of Moffatt is not that of the instant claims is noted. However, there is no probative evidence that the modified pigment of Moffatt is not that of the instant claims, within the scope of the instant claim

language, particularly where the above cited compounds are used which are expected to give the instantly claimed pigment. The teaching that the attached reactive groups allow the polymerization to occur in water does not show that nucleophilic groups of the polymers that result from the polymerization, noting the polymers of Moffatt, do not react with electrophilic groups of the reactive groups or vice versa. Moffatt, column 6, lines 15-18, argued by the applicant, is not seen as teaching away from the radical polymerization being one in which nucleophiles of the monomers react with electrophiles of the reactive groups on the pigment with the remaining unsaturated group reacting via the free radical mechanism disclosed. This however, does not exclude such nucleophiles on the polymers disclosed by Moffatt from subsequently reacting after the polymerization. In any event, it is not seen that the product of the patentee does not fall within the scope of that of the instant claims. The same argument applies to the instant method claims. The argument that the nucleophile/2-sulfatoethyl-sulphone reaction is not disclosed does not show that it is not inherent. If this reaction occurs in the instant application, it is also expected to necessarily occur in Moffatt's reaction system. See MPEP 2112. The examiner also does not agree that column 6, lines 15-18 of Moffatt necessarily means that the reaction of monomer with reactive groups of the pigment is a free radical reaction. It is seen that the polymerization is a free radical reaction. It remains unclear how or that the reaction with the compound of column 4, lines 52-63 in which X is an SO sub 2 would give a free radical reaction with the monomers of Moffatt. Reaction with the nucleophiles of the monomers of Moffatt appears much more likely, particularly considering the monomers having nucleophile gorups of Moffatt.

The cited prior art is applied to the newly presented claims 53-55 for the reasons stated above. Considering the mixture of open and closed language in the instant claims 53-55, it is not seen that any additional things which might be required by Moffatt, either in their products or processes, are excluded from the instant claims 53-55. MPEP 2113 and the rationale related thereto stated above also apply to the instant claims 54-55.

Applicant's arguments to monomers without nucleophilic groups ignores Moffatt's teachings of monomers with nucleophilic groups, which is the basis of this rejection. These arguments are therefore not commensurate with the full teachings of Moffatt and do not address the above stated rejection. Why nucleophilic containing polymers would attach to the pigments of Moffatt is clearly stated above, contrary to the applicant's arguments. The reason is that Moffatt teaches the use of the instantly claimed groups, including electrophiles and nucleophiles of the instant claims. They are expected to react in Moffatt just as they do in the instant claims. No probative evidence to the contrary is seen. See MPEP 2112. Attorney argument does not take the place of probative evidence where required (MPEP 2145). The examiner maintains that the above rationale is sufficient to require probative evidence to rebut it. The attorney argument that when monomer with nucleophile is chosen from Moffatt's monomers, the resulting reaction product would be very different from that of the present invention is not supported by probative evidence nor clearly seen on its face, particularly considering the full teachings of Moffatt and the breadth of the encompassed reactions of the instant claims. It is further not seen that this is "well known" as argued. The examiner has examined arts involving pigment dispersions for about 20 years and has never seen such a teaching nor has the examiner heard this in school. It is therefore not seen as being well known. The product of the modified pigment and attached

growing chain argued by the applicant is not subject of the above rejection. The above rejection relates to the pigment/fully grown polymer chain, which is encompassed by the instant claims. Addition reactions do not go on forever. There is no recitation of "preformed" in the instant claims. This argument is not commensurate in scope with the claims therefore. Additionally, it is not seen that even if "preformed" were recited, that the instant product claims would not still be anticipated by Moffatt's disclosure. See MPEP 2112-2113. The instant claims recite no molecular weight nor polydispersity nor provide probative evidence that polymers grown from the surface of pigment are any different than the polymers encompassed by the instant claims. Applicant's arguments in these regards are therefore not persuasive. The first sentence of the last paragraph of page 11 of the applicant's response of 8/19/09 is not understood. It is not seen how the growing polymers of Moffatt would react with the nucleophilic groups of the above discussion nor is there probative evidence that such reaction would be expected to occur. In any event, it is not seen that even were the apparently argued reaction between nucleophilic groups of the polymer of Moffatt and the growing polymer were to occur, that no nucleophilic groups would remain that react with the pigment, as discussed above. No polymerization proceeds to 100% completion. Therefore, unreacted nucleophilic groups would remain on the polymer of Moffatt which would react with electrophiles on the pigment of Moffatt per the expectation explained above. No probative evidence to the contrary is seen.

The difference between Moffatt et al. '257 and the presently claimed invention is the requirement in the instant claims of specific type of polymer.

Moffatt et al. '932, which is drawn to ink composition comprising modified pigment, disclose attaching a polymer such as polyethyleneimine to pigment in order to produce an ink

with increased smearfastness, enhanced print quality, and improved bleed control. Moffatt et al. '932 further disclose the equivalence and interchangeability of polyalkylene glycols, as disclosed by Moffatt et al. '257, with polyethyleneimine. (col. 1, lines 15-23; col.5, lines 43-44, 53, and 63-65, and col.6, lines 45-55).

In light of the motivation for using specific type of polymer disclosed by Moffatt et al. '932 as described above in paragraph 11, it therefore would have been obvious to one of ordinary skill in the art at the time of the instantly claimed invention to use such polymer in the pigment of Moffatt et al. '257 in order to produce an ink with increased smearfastness, enhanced print quality, and improved bleed control, and thereby arrive at the claimed invention. Again, where the moieties disclosed by Moffatt et al. are those of the instant claims, they are expected to necessarily and inherently produce compounds falling within the scope of the instant claims. There is no probative evidence that the argued reactions do not necessarily occur during the processing and reacting of the reference. See MPEP 2112-2113. The complexity and presence of side reactions in such complex mixtures is taught in basic undergraduate organic chemistry and is certainly expected by the ordinary skilled artisan.

The applicant's arguments have been fully considered but are not persuasive for the reasons stated above and the reasons stated in paragraph 7 above regarding Moffatt '257 alone. There is no showing of unexpected results commensurate in scope with the cited prior art and the instant claims.

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick D. Niland whose telephone number is 571-272-1121. The examiner can normally be reached on Monday to Friday from 10 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Patrick D Niland/
Primary Examiner
Art Unit 1796